

## CLAIMS

We claim:

- 1        1. A heat transfer device for low temperature ablation of tissue, comprising:  
2            first and second elongated segments, one of said first or second elongated  
3            segments providing a closed end of said heat transfer device;  
4            a bellows connecting said first and second elongated segments; and  
5            a tubular conduit disposed within and extending substantially through said first  
6            and second elongated segments, said conduit having an inner lumen for  
7            transporting a working fluid to a distal end of said one of said first or  
8            second elongated segments providing a closed end of said heat transfer  
9            device.
- 1        2. The device recited in claim 1, further comprising a smooth outer surface  
2            on at least one of said first and second elongated segments.
- 1        3. The device recited in claim 2, further comprising longitudinal ridges and  
2            grooves on said smooth outer surface.
- 1        4. The device recited in claim 1, further comprising an irregular interior  
2            surface within at least one of said first and second elongated segments, said irregular  
3            interior surface being adapted to induce mixing within a pressurized said working fluid.
- 1        5. The device recited in claim 1, further comprising a clot inhibiting outer  
2            surface coating on at least one of said first and second elongated segments.
- 1        6. The device recited in claim 1, wherein said first and second elongated  
2            elements are formed from highly conductive material.

1       7.     The device recited in claim 1, further comprising:  
2        a coaxial supply catheter having an inner catheter lumen coupled to said inner  
3        lumen of said tubular conduit; and  
4        a working fluid supply configured to dispense said working fluid and having an  
5        output coupled to said inner catheter lumen.

1       8.     The device recited in claim 7, wherein said working fluid supply is  
2     adapted to dispense a perfluorocarbon working fluid.

1       9.     The device recited in claim 7, wherein said working fluid supply is  
2     adapted to produce a pressurized said working fluid at a temperature less than about 0  
3     degrees C.

1       10.    The device recited in claim 1, further comprising:  
2        at least one additional elongated segment; and  
3        at least one additional bellows connecting said at least one additional elongated  
4        segment to one of said first and second elongated segments.